

Supporting Information

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Evaluation of Confounding by Individual Differences in Exposure to Major Life Events and Neurological, Mental, or Sleep Disorders Other than Insomnia

Two approaches were taken to evaluate possible confounding of the reported associations and models by common causes related to individual differences in exposure to major life events or neurological, mental, or sleep disorders other than insomnia. As queried using the NSR implementation of the 30-item LONGSCAN version of the LES (40), participants had a lifetime experience of an average (SD) of 14.9 (4.5) major life events. As queried using the NSR implementation of the DSISD (41) that also includes sections to query all current and past disorders according to the categories of the 10th edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-10), a neurological, mental, or sleep disorder other than insomnia could not be excluded in 513 participants: a neurological disorder in $n = 13$, a mental disorder in $n = 87$, another sleep disorder in $n = 318$, both a neurological and a mental disorder in $n = 2$, both a neurological disorder and another sleep disorder in $n = 8$, both a mental disorder and another sleep disorder in $n = 82$, and disorders in all three categories in $n = 3$.

First, all regression equations evaluating bivariate associations were run once more with inclusion of covariates for the number of major life events and the dummy-coded presence of mentioned disorder categories. All significant associations remained highly significant, whereas nonsignificant associations remained nonsignificant. In detail, the adjusted β -coefficients and their significance were as follows. Insomnia severity remained specifically and very significantly associated with nocturnal mentation [$\beta = 0.25$,

$T(1,191) = 9.16, P < 10^{-18}$], with hyperarousal [$\beta = 0.41, T(1,191) = 15.08, P < 10^{-46}$] (all coefficients also adjusted for age and gender in both measures), and specifically with emotional distress lasting overnight [$\beta = 0.23, T(1,190) = 8.08, P < 10^{-14}$], but not with distress resolved within a day (i.e., without sleep) [$\beta = -0.03, T(1,190) = -1.00, P = 0.32$] (all coefficients also adjusted for age and gender). The more frequently people reported nocturnal mentation, the more frequently they experienced long-lasting distress [$\beta = 0.23, T(1,190) = 7.94, P < 10^{-14}$], but not short-lasting distress [$\beta = 0.05, T(1,190) = 1.85, P = 0.06$]. The more people experienced distress that lasted overnight, the higher were their hyperarousal ratings [$\beta = 0.40, T(1,190) = 15.33, P < 10^{-47}$]. Short-lasting distress was not associated with hyperarousal [$\beta = 0.02, T(1,190) = 0.79, P = 0.43$]. In summary, associations found remained highly significant when adjusting for individual differences in exposure to major life events or neurological, mental, or sleep disorders other than insomnia.

Second, to evaluate possible confounding, a sensitivity analysis evaluated the structural equation model parameters in the subset of 686 participants who were unlikely to suffer from any neurological, mental, or sleep disorder other than insomnia [511 female and 175 male; mean (SD) of 50.9 (14.1) y of age; 398 people without sleep complaints and 182 subthreshold, 83 moderate, and 23 severe insomniacs]. As shown in Fig. S1 below, the partial mediation effect of long-lasting distress in this subsample remained selective and highly significant [53.5%; $\beta_2 \times \beta_3 = 0.09, T(681) = 5.54, P < 10^{-6}$], supporting the robustness of the findings and making it unlikely that they result from spurious correlations due to common underlying confounders.

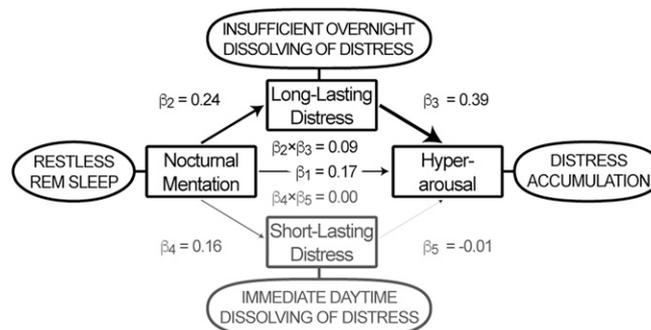


Fig. S1. Structural equation model restricted to 686 participants. The thought-like nocturnal mentation that is specifically associated with fragmented REM sleep and increased eye movement density appears to reflect a process that interferes with overnight dissolving of distress, resulting in its accumulation as indexed by hyperarousal. The model with restricted inclusion of only the 686 participants who were free of any neurological, mental, or sleep disorder other than insomnia suggests that 53.5% of the association between thought-like nocturnal mentation and hyperarousal [$\beta_1 = 0.17, T(681) = 4.98, P < 10^{-5}$] is mediated by long-lasting distress [$\beta_2 \times \beta_3 = 0.09, T(681) = 5.54, P < 10^{-6}$], without involvement of individual differences in the frequency of experiencing short-lasting distress [$\beta_4 \times \beta_5 = 0.00, T(681) = -0.38, P = 0.74$].

